



**Compact CHP units 50 – 500 kW**  
**compact · efficient · reliable**



**SOKRA<sup>®</sup>**  
**therm**  
Cogeneration



## **SOKRATHERM cogeneration units** **Individual plants for best energy utilisation**

With their highly efficient, clean and economic production of **electricity** and **heat**, CHP units (Combined Heat and Power, also: cogeneration) make a substantial contribution to a sustainable energy supply.

Compared to the conventional supply, natural gas powered SOKRATHERM CHP units **reduce the primary energy consumption by ca. 40% and the CO<sub>2</sub> emissions by ca. 60%**. This is why such plants based on the highly efficient principle of cogeneration are supported by laws or subsidies in many countries.

SOKRATHERM offers cogeneration units powered by natural gas, sewage gas or biogas in five power classes.

The foundation of our high quality level and innovation power is experience: For over 35 years, we've produced compact CHP units for most various buildings with a wide range of requirements. In 2006, we introduced a quality management system certified by TUV in accordance to the ISO 9001 standard. With this step, a continuous process to secure product quality and customer satisfaction was incorporated in the company.



This clear focus on quality in product and service has provided us an excellent market position: With over 1,200 compact CHP units delivered worldwide and numerous awards, we are one of Germany's leading CHP unit manufacturers in our power range.

Typical applications are:

- ▶ Hospitals and nursing homes
- ▶ Administration buildings
- ▶ Housing schemes
- ▶ Industrial and commercial sites
- ▶ Swimming pools
- ▶ Sewage and biogas plants
- ▶ Breweries
- ▶ Food processing plants

Besides numerous power companies, DBO (Design-Build-Operate) contractors and customers from the public sector, well-known companies like Siemens, SMA, SAP, Philips, AEG, Continental, Johnson & Johnson, Maritim and Marriott Hotels trust in our products.

The high dedication of our workforce, its team spirit and the flexibility inside the company allow SOKRATHERM to be a top runner: working with cutting edge technology, committed to customer needs and strictly oriented towards economically and ecologically expedient solutions.

## 50 kW class



CHP ventilator cover,  
air exit either sideways or upwards



Compact CHP unit type GG 50

## 100 kW class



Front-end with touchpanel



Compact CHP unit type GG 140

### Cogeneration = efficient energy

CHP units allow the efficient generation of heat and power on site and without transmission losses. In contrast to large power plants, they can be turned on and off and regulated on partial load within seconds. This possibility to supply electricity quickly and therefore being able to balance the production fluctuations of renewable energies grants them an increasing importance in the energy market.

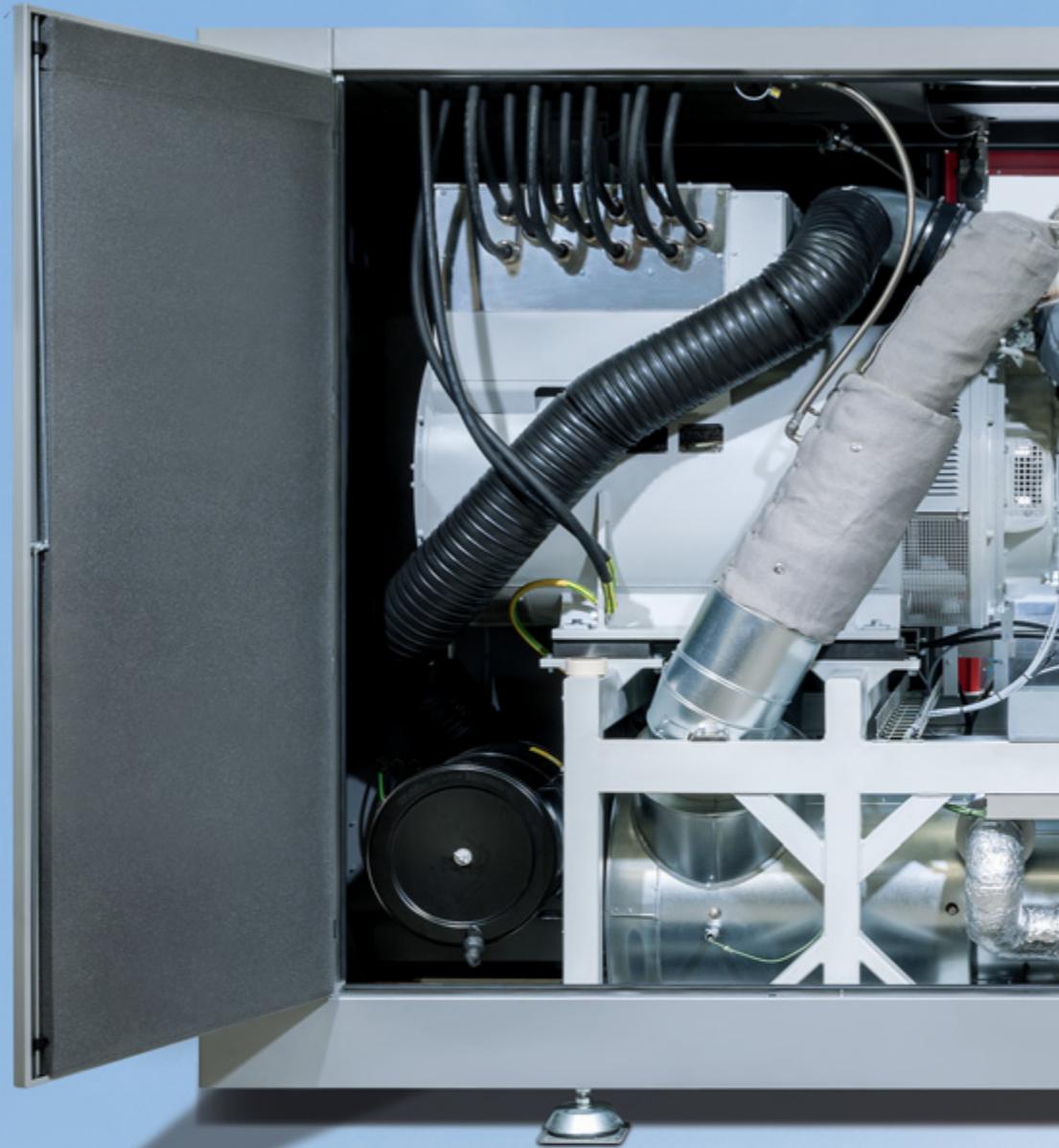
The core of the CHP unit is a combustion engine which powers a generator. The generated electrical power can be consumed on site or fed into the mains. The heat generated in the combustion process is extracted by a series of heat exchangers and can be used for heating, hot water generation, process heat or cooling.

With this extensive utilisation of energy, our CHP units reach efficiency rates of ca. 90% and even more with an additional exhaust condensation heat exchanger.

### Flexible application

Our CHP units can also be configured to take over the electricity supply of defined consumers (e.g. pumps, sprinklers, production lines, computers, lighting) in the case of a mains failure. It is also possible to fit the units as ›hot coolers‹ which can operate on the higher temperature level 95/80 °C instead of 90/70 °C to e.g. supply absorption chillers for air-conditioning of buildings or process cooling. On top of that, we offer special solutions for steam generation and heating up thermal oil.

**500 kW class**



Compact CHP unit type GG 530

The modular design allows the combination of our CHP units in size and numbers to match the building's requirements exactly. Hospitals have a different power demand than office buildings, swimming pools have other heating needs than industrial plants.

With their compact design, our CHP units convert the engine power and combustion heat with the least possible losses into electricity and useable thermal heat. This way, the space requirement on site is minimised as well as the expenses for installing the unit.

#### **Reliable operation**

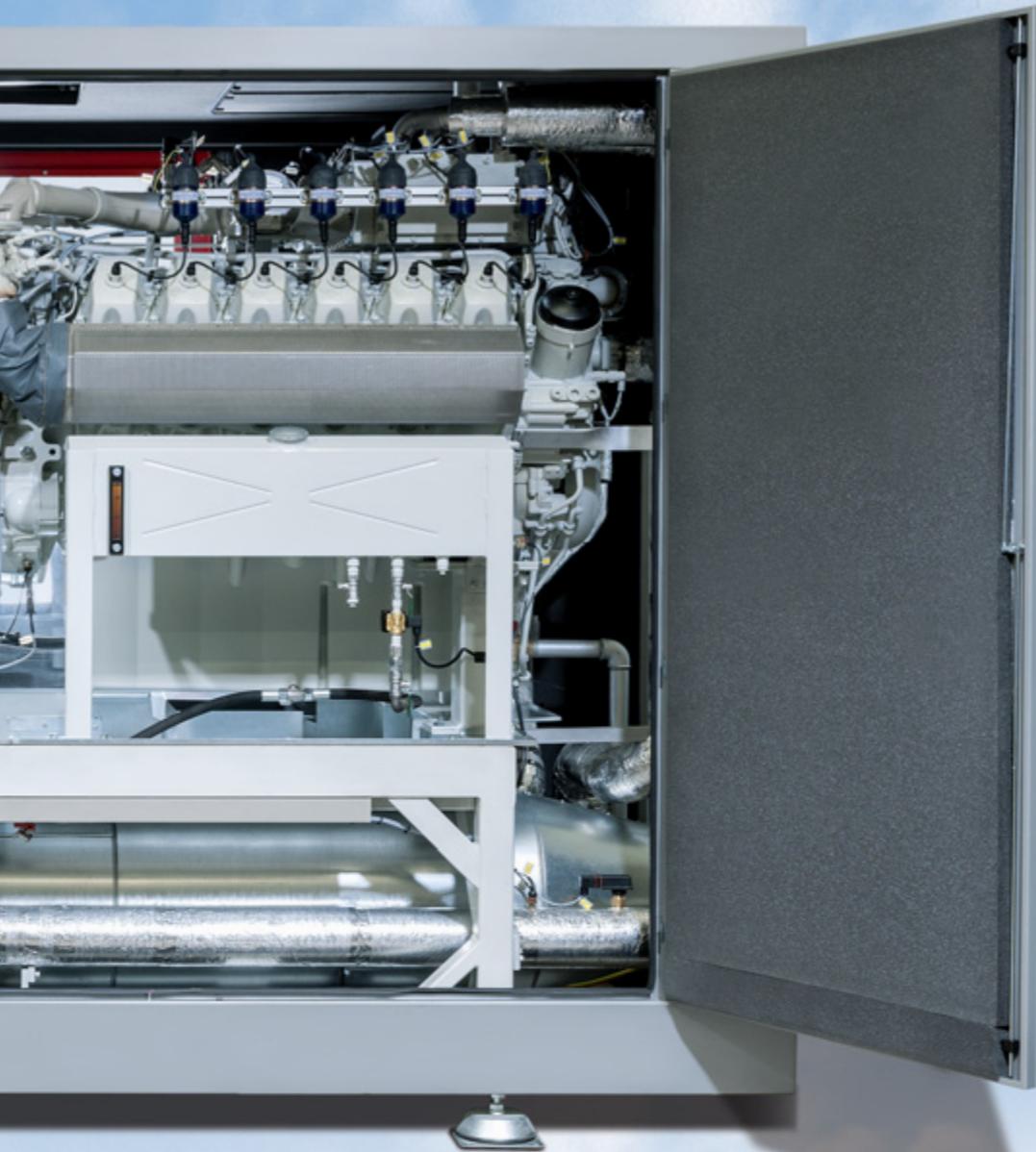
The manufacturing process is tailored to the customer's needs and followed by an extensive test bench run including

a first servicing of the unit. We deliver our compact CHP units ready to operate inside a sound absorbing case with an integrated switchgear cabinet in order to ensure the quickest possible commissioning.

The triple elastic decoupling prevents vibrations from spreading to the building. Therefore, a separate foundation is rarely required.

Only long-term proven components from well-known producers are implemented in our units. This way we achieve a minimum fault potential and maximum product quality, which is confirmed regularly by our customer satisfaction surveys.

# SOKRATHERM: Modular technology – flexible and ecological up to 2,000 kW power in multi-unit plants



## Service

Integral parts of our offer are well-engineered maintenance concepts which are continuously adapted to the technical progress. For every CHP project, we offer individual service packages – from the simple regular service with customer participation up to the ›all-inclusive carefree package‹ including operation optimisation and general overhaul. A network of service points makes sure that our customers always have competent service personnel nearby.

## CHP unit sizing

To achieve the best economic result the CHP unit covers the heat and power base load while the peak loads are covered by a boiler and the power mains. The CHP size is usually

determined by the object's maximum heat demand ( $Q_{max}$ ). Depending on the climate zone and the cost of power and gas, a profitable operation can be reached when the heat output of the CHP unit is 10 – 30% of  $Q_{max}$ . In special cases, e.g. for peak or emergency power supply, the CHP unit is dimensioned according to the electrical power demand.

## Multi unit plants

For better adaption to the heat demand and/or to achieve a backup supply, the required power can be split up into several CHP units.

## 200 kW class



SOKRATHERM gas regulation unit – can be placed freely depending on gas connection



Compact CHP unit type GG 237

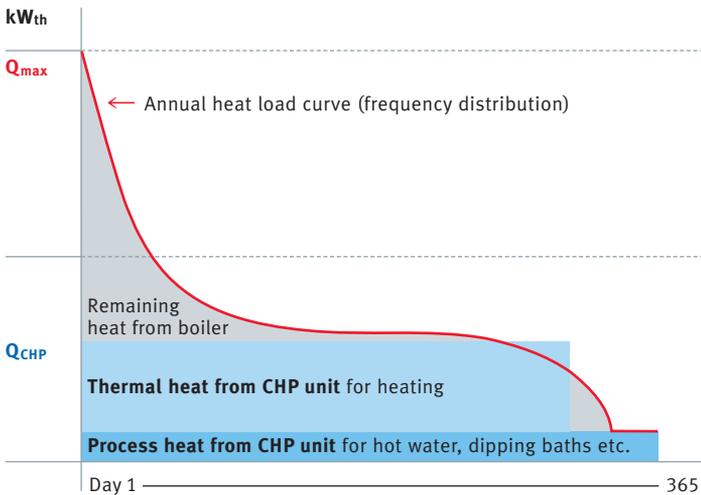
## 400 kW class



Connections for heating water and exhaust



Compact CHP unit type GG 402



$Q_{max}$  (kW<sub>th</sub>)

300 – 800

500 – 2,000

900 – 3,500

1,700 – 5,000

2,200 – 7,500

bis 20,000

CHP unit class (kW<sub>el</sub>)

50 kW

100 kW

200 kW

400 kW

500 kW

individual sizing

$Q_{max}$  = Object's maximum heat requirement

$Q_{CHP}$  = Thermal power of the CHP unit

### CHP unit control

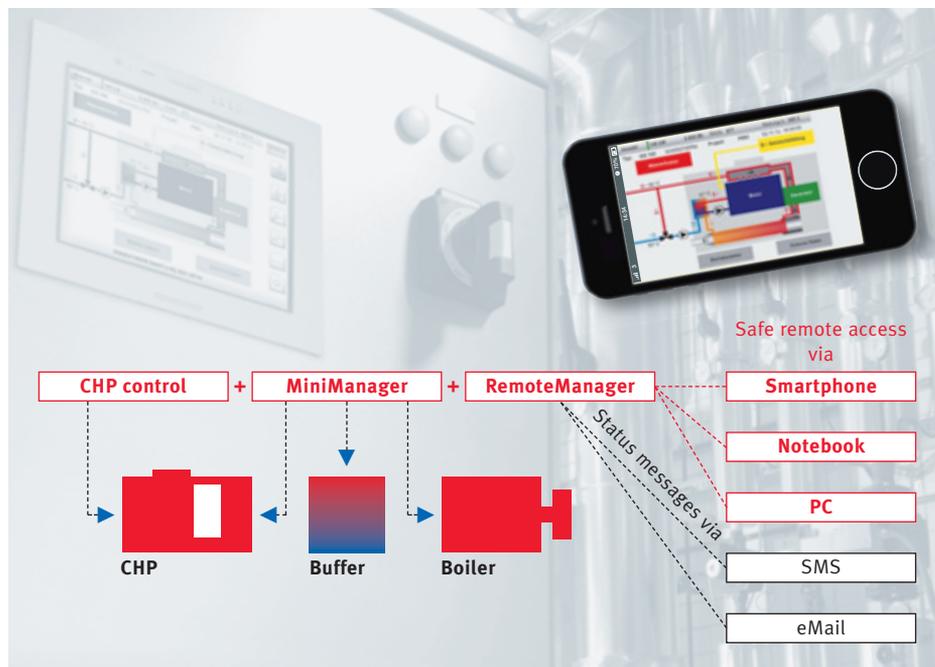
For fully automatic and safe CHP operation

### MiniManager

For intelligent interaction between CHP, boiler and buffer

### RemoteManager

Internet based remote monitoring and controlling system



## Control and monitoring system for economic operation of the whole CHP scheme

The CHP unit is operated and monitored by an industrial computer. Its touchpanel allows comfortable handling and a detailed insight into current operating values. It can also display saved values in order to analyse the operational behaviour of the unit and if necessary improve it by changing the units' parameters. Numerous interfaces make sure that the unit can be connected to external systems.

For perfect interaction between CHP, buffer and boiler the **MiniManager** control system is included in every unit as a master control. For plants with one CHP and e.g. more than one boiler or an extended buffer management the **MiniManager PRO** applies.

The master control **MaxiManager** can provide for the runtime optimised operation of multiple CHP units and boilers and/ or the load management during emergency power operation.

Our internet based **RemoteManager** enables the remote control and remote monitoring of the whole plant from a desktop PC, via notebook or even by smartphone. Service reports are generated online and sent to the service center automatically. A standardised web interface allows the units to be integrated into virtual power plants to provide balancing energy.

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